CLAIMS

1. A rocket engine nozzle comprising a system for controlling jet separation of the flow in the nozzle, wherein said control system exhibits a plurality of separation triggering elements (5, 10) arranged in such a way as to generate, from mutually spaced initiation points (9), distinct zones (6) of jet separation, so as to form a three-dimensional separation of the flow.

2. The nozzle as ~~claimed~~ in claim 1, wherein the flow control system exhibits a device for injecting fluid through a wall of the nozzle, which exhibits, in at least one injection cross section substantially perpendicular to the axis of the nozzle, at least two independent injection orifices (5) distributed over the perimeter of the wall of the nozzle, each injection orifice (5) constituting a said separation triggering element inducing a said distinct zone (6) of jet separation.

3. The nozzle as claimed in claim 2, wherein the injection orifices (5) are uniformly distributed over the perimeter of the wall of the nozzle (4).

4. The nozzle as claimed in claim 3, wherein the injection orifices (5) are two in number and are diametrically opposed.

5. The nozzle as claimed in claim 3, wherein the injection orifices (5) are three in number and are arranged at substantially 120° to one another over the perimeter of the nozzle (4).

6. The nozzle as claimed in ~~one of the preceding claims~~ claim 1, wherein said injection cross section is arranged at a distance D from the throat (3) of the nozzle which is substantially less than the distance Do of spontaneous separation of the flow.

7. The nozzle as claimed in claim 6, wherein the injection device exhibits a plurality of injectors (5) situated at different distances D, and a distributing device for feeding one or other of said injection cross sections (5), in such a way as to take into account the

variation of said distance Do as a function of altitude.

8. The nozzle as claimed in ~~one of the preceding claims~~, wherein the flow control system exhibits an external stabilizing device integral with a ground-based installation and which exhibits, on the one hand, a number N(N ≥ 2) of injection tubes (10) each of which constitutes a said separation triggering element, and which are distributed, preferably downstream of the nozzle (4), in such a way as to direct in counter-current to the main stream of the nozzle a stabilizing fluidic stream toward N impact points (12) situated downstream of the throat (3) of the nozzle (4), and on the other hand, a device (AL) for feeding the injection tubes (10) so as to feed them with fluid for a predetermined transient duration of ignition before takeoff, with a flow rate which is sufficient for each impact point (12) to induce a different zone of jet separation of the nozzle.

9. The nozzle as claimed in claim 8, wherein the injection tubes (10) are parallel to the axis of the nozzle.

10. The nozzle as claimed in ~~either of claims 8 and 9~~, wherein the injection tubes (10) are arranged at the outlet of the nozzle (4) exit (8).

11. The nozzle as claimed in ~~one of claims 8 to 10~~, wherein the impact points (12) of the external stabilizing device are uniformly distributed over the perimeter of the wall of the nozzle.

12. The nozzle as claimed in claim 11, wherein the impact points (12) of the external stabilizing device are two in number and are diametrically opposed.

13. The nozzle as claimed in claim 11, wherein the impact points (12) of the external device are three in number and are arranged at substantially 120° to one another over the perimeter of the nozzle.